

**Claim Rejections Under 35 USC §112**

Claims 1-10 are rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Claims 1 and 10 have been amended to correct a defect of insufficient antecedent basis for claim language. A reconsideration for allowance of claims 1-10 is respectfully requested of the Examiner.

**Claim Rejections Under 35 USC §102**

Claims 1, 6-8, 10, 13-14 and 16-17 are rejected under 35 USC §102(a) as being anticipated by Yamakawa et al '960. It is contended that Yamakawa et al teaches substantially the present invention including that the reference resistor and the flow-sensing resistor are formed of a non-platinum resistive material, even though the Examiner noted that Yamakawa et al discloses the flow-sensing resistors are made of platinum. The Examiner reasoned that platinum is only given as an example and that other heat-sensitive materials may be used as disclosed at col. 8, lines 31-43.

The rejection of claims 1, 6-8, 10, 13-14 and 16-17 under 35 USC §102(a) based on Yamakawa et al is respectfully traversed.

The Applicants respectfully submit that all three independent claims 1, 10 and 17 of the present invention require that:

"... said reference resistor and said flow-sensing resistor are formed of a non-platinum resistive material;"

(Claims 1 and 10)

"thick film printing a reference resistor from a non-platinum containing paste;

thick film printing a flow-sensing resistor from a non-platinum containing paste;"

(Claim 17)

To the contrary, Yamakawa et al clearly discloses that, at col. 8, lines 38-42:

"... heat generating resistors 4 and 5 formed of heat-sensitive material such as platinum and deposited on the base film 2 through vapor

deposition, sputtering or the like process in the form of a thin film having a thickness of 0.2  $\mu\text{m}$ ."

Similarly, at col. 8, lines 49-53:

"deposited on the insulating base film 2 through evaporation, sputtering or the like process are temperature compensating resistors 6A and 6B in the form of heat-sensitive films formed of platinum or the like in a thickness of 0.2  $\mu\text{m}$ ."

As a matter of fact, in the background section of the present invention specification, at page 3, lines 5-12, the Applicants have specifically disclosed a prior art patent as teaching the same, i.e. a thin film sputtered platinum.

To anticipate a claim of a patent, a single source must contain all of its essential elements. See e.g., Tights, Inc. v. Acme McCrary Corp., 191 USPQ 305 (4<sup>th</sup> Cir. 1976). The Yamakawa et al reference does not teach all of the essential elements of the present invention, i.e. reference resistor and flow sensing

U.S.S.N. 09/679,668

resistor formed of a non-platinum resistive material, reference resistor at an ambient temperature without heating, and flow sensing resistors heated to a temperature higher than the ambient temperature.

The rejection of claims 1, 6-8, 10, 13-14 and 16-17 under 35 USC §102(a) based on Yamakawa et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

#### **Claim Rejections Under 35 USC §103**

Claims 2-5, 9, 11, 15 and 18-21 are rejected under 35 USC §103(a) as being unpatentable over Kawai et al '811 in view of Yamakawa et al '960. The Examiner reasoned that while Yamakawa et al does not teach the following:

1. An oxide composition of Pb, Ru, Si and Bi;
2. A reference resistor having an electrical resistance at least 15 times that of the flow-sensing resistor;
3. The resistors having a thickness between 2 microns and 30 microns;
4. The resistors having, preferably, a thickness between 5 microns and 20 microns;

5. Printing the resistors to a thickness between 4 microns and 50 microns;
6. Forming the resistors in the same printing process; and
7. Firing the resistors after the printing step.

The Examiner nevertheless, reasoned that Kawai et al '811 disclosed a reference resistor and flow-sensing resistors having a thickness between 2 microns and 30 microns and preferably, between 5 microns and 20 microns at col. 6, lines 9-12.

The rejection of claims 2-5, 9, 11, 15 and 18-21 under 35 USC §103(a) based on Kawai et al and Yamakawa et al is respectfully traversed.

The Applicants respectfully submit that Kawai et al '811, at col. 6, lines 5-12, teaches the following:

"... the subsequent steps comprise forming a **0.1  $\mu$ m-thick platinum film** by sputtering on the entire surface of the support film 2, patterning the platinum film by the photolithography and etching techniques, therefore forming a lattice shaped heating

U.S.S.N. 09/679,668

resistance element 4, temperature detecting resistance elements 5 and 6 and a comparative resistance element 7 having a **pattern width** of 5  $\mu\text{m}$  and a pattern interval of 5  $\mu\text{m}$ , ..."

The Applicants respectfully submit that the thickness of the platinum film sputtered by Kawai et al is only 0.1  $\mu\text{m}$ , which is completely outside the range of 2  $\mu\text{m}$  ~ 30  $\mu\text{m}$  taught by the present invention. The 5  $\mu\text{m}$  disclosed by Kawai et al refers to the width of the resistance element and the spacing between the elements, and has nothing to do with the thickness.

The Applicants further submit that Kawai et al '811 does not lend any additional weight in a §103(a) rejection in addition to the Yamakawa et al '960 reference.

The rejection of claims 2-5, 9, 11, 15 and 18-21 under 35 USC §103(a) based on Kawai et al and Yamakawa et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

U.S.S.N. 09/679,668

Claim 12 is rejected under 35 USC §103(a) as being unpatentable over Wienand et al '265 in view of Yamakawa et al '960. It is contended that while Yamakawa et al does not disclose an insulating substrate formed of a ceramic material, such is disclosed by Wienand et al.

The rejection of claim 12 under 35 USC §103(a) based on Wienand et al and Yamakawa et al is respectfully traversed.

Claim 12 depends on independent claim 10 which recites "said reference resistor and said flow-sensing resistor both are formed of a single non-platinum resistive material" and furthermore, the reference resistor is kept at ambient temperatures while the flow-sensing resistor is kept at a temperature higher than the ambient temperature. The Applicants respectfully submit that none of such limitations were disclosed by Wienand et al nor Yamakawa et al, either singularly or in combination thereof.

The rejection of claim 12 under 35 USC §103(a) based on Wienand et al and Yamakawa et al is respectfully traversed. A reconsideration for allowance of claim 12 is respectfully requested of the Examiner.

U.S.S.N. 09/679,668

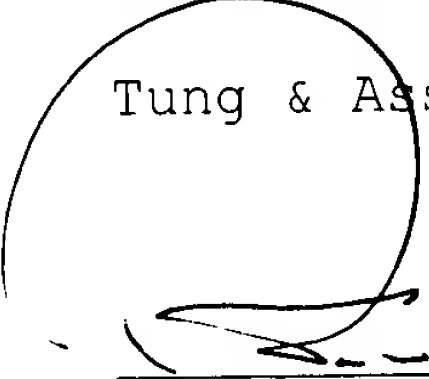
Based on the foregoing, the Applicants respectfully submit that all of the pending claims, i.e. claims 1-8 and 10-21, are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version With Markings To Show Changes Made".

In the event that the present invention is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims

Claim 9 has been cancelled.

Claim 1 has been amended as follows:

1. (Amended) A gaseous flow sensor comprising:  
a substrate formed of an electrically insulating material;  
a reference resistor formed on said substrate and disposed in  
[said] a gaseous flow at an ambient temperature without heating;  
a flow-sensing resistor formed on said substrate and disposed  
in said gaseous flow heated to a temperature higher than said  
ambient temperature, wherein said reference resistor and said flow-  
sensing resistor are formed of a non-platinum resistive material;  
and  
an electrical circuit in electrical communication with said  
reference resistor and said flow-sensing resistor.

Claim 10 has been amended as follows:

10. (Amended) A gaseous flow sensor comprising:  
a substrate formed of an electrically insulating material;  
a reference resistor formed on said substrate and disposed in  
[said] a gaseous flow at an ambient temperature without heating;  
a flow-sensing resistor formed on said substrate and disposed  
in said gaseous flow heated to a temperature higher than said

U.S.S.N. 09/679,668

ambient temperature, wherein said reference resistor and said flow-sensing resistor both are formed of a single non-platinum resistive material; and

an electrical circuit in electrical communication with said reference resistor and said flow-sensing resistor.